

What is claimed is:

1. A multipressure plenum system for supporting a conveyor belt of a gas supported belt conveyor, said multipressure plenum system including:

a plenum having a support surface including a plurality of apertures and a chamber in fluid communication with said apertures;

a first conduit in fluid communication with said chamber of said plenum, said first conduit adapted to supply gas at a first pressure to said chamber;

a second conduit in fluid communication with said chamber of said plenum, said second conduit adapted to supply a gas at a second pressure to said chamber;

whereby said first conduit is adapted to supply the gas at said first pressure to said chamber of said plenum such that the gas at said first pressure flows through said apertures to form a gas cushion between the conveyor belt and said support surface of said plenum, and said second conduit is adapted to supply the gas at said second pressure to said chamber of said plenum such that the gas at said second pressure flows through said apertures in said support surface to form the gas cushion.

2. The multipressure plenum system of claim 1 including a valve in fluid communication with said first conduit, said valve adapted to prevent the gas at said second pressure as supplied to said chamber of said plenum from flowing out of said first conduit.

3. The multipressure plenum system of claim 1 including a pressure regulator in fluid communication with said second conduit, said pressure regulator adapted to control the pressure at which the gas at said second pressure is supplied to said chamber of said plenum.

4. The multipressure plenum system of claim 1 including a valve in fluid communication with said second conduit, said valve adapted to control the flow of gas to said second conduit.

5. The multipressure plenum system of claim 4 including an accumulator in fluid

communication with said second conduit, said accumulator adapted to contain gas at a pressure at least equal to said second pressure.

6. A multipressure plenum system for supporting a conveyor belt of a gas supported belt conveyor, said multipressure plenum system including:

a plenum having a support surface including a plurality of apertures and a chamber in fluid communication with said apertures;

a first source of gas at a first pressure, said first source of gas adapted to be placed in fluid communication with said chamber of said plenum;

a second source of gas at a second pressure, said second source of gas adapted to be placed in fluid communication with said chamber of said plenum;

whereby said first source of gas is adapted to supply gas at said first pressure to said chamber of said plenum such that the gas flows through said apertures in said support surface to form a gas cushion between the conveyor belt and said support surface of said plenum, and said second source of gas at said second pressure is adapted to supply gas at said second pressure to said chamber of said plenum such that said gas at said second pressure flows through said apertures in said support surface and forms the gas cushion that supports the conveyor belt, the gas cushion provided by said second source of gas adapted to support more weight than the gas cushion provided by said first source of gas.

7. The multipressure plenum system of claim 6 wherein said second pressure of the gas supplied by said second source of gas is greater than the pressure of the gas supplied by said first source of gas at said first pressure.

8. The multipressure plenum system of claim 6 wherein said first source of gas comprises a blower.

9. The multipressure plenum system of claim 6 wherein said second source of gas comprises an air compressor.

10. The multipressure plenum system of claim 6 wherein said second source of gas comprises an accumulator.

11. The multipressure plenum system of claim 6 including a valve providing selective fluid communication between said first source of gas and said chamber of said plenum.

12. The multipressure plenum system of claim 6 including a pressure regulator in fluid communication between said second source of gas and said chamber of said plenum, said pressure regulator adapted to control the pressure at which the gas at said second pressure is provided to said chamber of said plenum.

13. The multipressure plenum system of claim 6 including a valve providing selective fluid communication between said second source of gas and said chamber of said plenum.

14. The multipressure plenum system of claim 6 including a second plenum, said second plenum including a support surface having a plurality of apertures and a chamber in fluid communication with said apertures, said first source of gas being in fluid communication with said chamber of said second plenum.

15. The multipressure plenum system of claim 6 including a pressure relief valve adapted to vent gas within said chamber of said plenum to the atmosphere when the gas within said chamber reaches a selected pressure.

16. The multipressure plenum system of claim 6 including a pressure switch for sensing when the pressure of the gas within said chamber of said plenum falls below a selected pressure.

17. A plenum for supporting a conveyor belt of a gas supported conveyor, said plenum including:

a support member extending between a first end and a second end and between a first

side edge and a second side edge, said support member including a plurality of first apertures and a plurality of second apertures;

a first channel member attached to said support member, said first channel member forming a first chamber in fluid communication with said plurality of first apertures in said support member; and

a second channel member attached to said support member, said second channel member forming a second chamber in fluid communication with said plurality of second apertures in said support member;

whereby said first chamber is adapted to supply gas from a first source of gas to said plurality of first apertures to provide a cushion of gas between the conveyor belt and the support member, and said second chamber is adapted to supply gas from a second source of gas to said plurality of second apertures to provide the cushion of gas for supporting the conveyor belt above the support member.

18. The plenum of claim 17 wherein said plurality of first apertures are located along a generally linear first line extending from said first end to said second end of said support member, and said plurality of second apertures are located along a generally linear second line extending from said first end to said second end of said support member.

19. The plenum of claim 18 wherein said plurality of second apertures are located along said second line and are located along a generally linear third line, said third line being generally parallel to said second line.

20. The plenum of claim 17 wherein said support member includes a plurality of third apertures, and a third channel member attached to said support member forming a third chamber, said third chamber being in fluid communication with said plurality of third apertures, said third chamber adapted to supply gas from the second source of gas to said plurality of third apertures for supporting the conveyor belt.

21. The plenum of claim 20 wherein said plurality of third apertures are located along a generally linear third line, said third line extending from said first end to said second end of said support member.

22. The plenum of claim 21 wherein said first line of said plurality of first apertures is located between said second line of said plurality of second apertures and said third line of said plurality of third apertures.

23. The plenum of claim 21 wherein said first channel is located between said second channel and said third channel.

24. A method of operating a gas supported belt conveyor including a conveyor belt adapted to be supported above a plenum by a gas cushion, said method comprising the steps of:

providing a flow of gas at a first pressure to the plenum, said gas at said first pressure forming the gas cushion;

stopping the flow of gas at the first pressure to the plenum;

providing a flow of gas at a second pressure to the plenum, the second pressure being greater than said first pressure, said gas at said second pressure forming a gas cushion that is adapted to support more weight than the gas cushion formed by the gas at the first pressure.

25. The method of claim 24 including the steps of stopping the flow of gas at the second pressure, and providing a flow of gas at the first pressure to the plenum.

26. The method of claim 24 including the step of sensing when the conveyor belt becomes overloaded whereupon the flow of gas at the first pressure is stopped and the flow of gas at the second pressure is provided to the plenum.